

THE COCCIDAE OF THE WILLIAMS GALAPAGOS EXPEDITION

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(Figs. 33 to 37 incl.)

This expedition was sent out by the Department of Tropical Research of the New York Zoological Society. The Coccidae reported on below were very kindly offered to the writer for study by their collector, Dr. William Beebe, who has also furnished all the collection data quoted for the different species represented.

The writer is indebted to Miss Amalia Shoemaker for the accompanying figures showing the structural details of the newly described species.

In spite of its very obvious deficiencies, the scheme of classification given in the Fernald Catalogue of the Coccidae of the World, 1903, has been followed in assigning the species to genera and subfamilies.

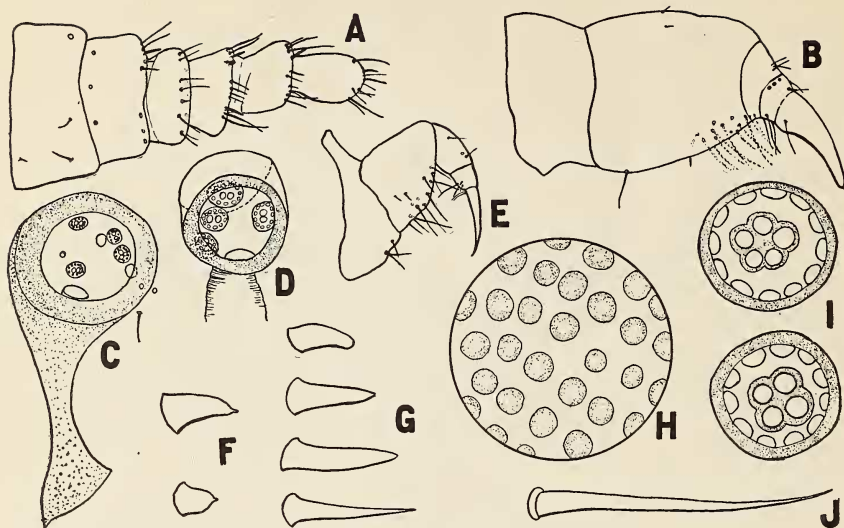
Subfamily MARGARODINAE

Genus *Margarodes* Guilding

***Margarodes similis* sp. nov.**

Adult Female.—(Description drawn up from fragments of one specimen only.) Nothing available regarding the normal external appearance, actual size or shape of body; the single antenna available 5-segmented, with the 4th segment incompletely divided twice, the antennae therefore probably normally 7-segmented; measurements of the segments in microns as follows: I, 71; II, 61; III, 22; IV, 100; V, 64; antennae beset with the usual stout spines and setae, not displaying any apparent peculiarities; legs characteristic for the genus, the thickened claw of the posterior pairs somewhat more slender than the same part in the legs of the nearest known relative, *rileyi*; mouthparts presumably wanting; thoracic spiracles very considerably larger than the abdominal, with a distinct lateral chitinous bar and four or perhaps more bilocular center, multilocular disk pores within the external opening, and two tiny pores externally immediately adjacent to the opening; abdominal spiracles much smaller, tubular, each with a pore collar of about 4, similar, bilocular center pores, spiracles presumably present in seven pairs, although only a single spiracle available for examination; derm pores nearly circular, with a large quinquilocular center surrounded by a band of smaller loculi, this in turn surrounded by a heavy

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FIG. 33. *MARGARODES SIMILIS*, sp. nov.

A, antenna, $\times 120$; B, fore leg, $\times 60$; C, thoracic spiracle, $\times 230$; D, abdominal spiracle, $\times 530$; E, middle leg, $\times 60$; F, body spines of *Margarodes rileyi*, for comparison $\times 530$; G, body spines, $\times 530$; H, derm, showing papillae, $\times 530$; I, detail of disk pore, $\times 1500$; J, detail of body seta, $\times 530$; all adult female.

collar; no other sorts of derm pores except those described in connection with the spiracles located; all of the derm available for examination bearing many, rather crowded, uniformly distributed, slightly convex to nearly hemispherical papillae; derm with numerous, moderately stout spines with apices varying, according to the stoutness, from acutely to almost obtusely pointed, and with numerous rather stout setae; the arrangement of these spines and setae not ascertainable from the fragments available for study; anal tube not available and no ventral cicatrices evident.

Immature Female Tests.—Of moderate size, made up of more or less distinctly overlapping layers, golden to reddish-brown in color, not differing in any evident particulars from the tests of *M. rileyi* and *M. formicarum*.

This species has been described from a single, very fragmentary, adult female and from a considerable number of tests of the immature stage female collected by Dr. William Beebe with the following data: "from rootlets of *Maytena*, Seymour Bay, Indefatigable, April 25" (Invert. no. 2263) (holotype adult female and intermediate female tests); "from roots of yellow-plumed ground plant, Eden Island, N. W. Coast of Indefatigable, April 8th" (Invert. no. 2219); "from debris under *Bursera* close to beach, South Seymour, north-east of Indefatigable, April 19th" (Invert. no. 2262); "Seymour Bay, Indefatigable," no date, host nor number; (all of these last represented by female tests only).

The type female and a number of the tests are in the U. S. National Collection of Coccidae.

This species, on the basis of the material available for study, is extremely closely related to *M. rileyi* Giard, as this species is identified from the Florida Keys, differing positively, so far as can be observed, only in having the body spines normally pointed at apices and without the nipple-like continuation of each spine apex which appears to be characteristic of *M. rileyi*.

Subfamily ORTHEZIINAE

Genus *Orthezia* Bosc.

Orthezia galapagoensis Kuw.

This species of *Orthezia* is represented in the collection by two lots of material as follows: "from stems of *Heliotropium parviflorum*, Seymour Bay, Indefatigable, April 25" (Invert. no. 2369) and on "*Bursera*, Duncan, April 25" (Invert. no. 2390).

Subfamily DACTYLOPIINAE

Genus *Eriococcus* Targ.

Eriococcus papillosus sp. nov.

Sac of Female.—Broad oval, moderately convex, the single sac available appearing, after immersion in alcohol, thin and fragile, white; length about 3 mm., width about 2 mm.

Adult Female.—Length as mounted 2.5 mm., width 1.7 mm.; oval, tapering more or less distinctly at apices; derm clearing completely on treatment with caustic potash, except for anal lobes; antennae normally 6-segmented, the measurements in microns of the segments of those available for examination as follows: I, uncertain, due to distortion; II, 36–46; III, 104–118; IV, 22–25; V, 18–25; VI, 36–40; beak and spiracles not unusual for the genus, the former about 100 μ wide and 140 μ long; legs not unusual for the genus, the measurements of a middle leg in microns as follows: coxa about 114, trochanter 75, femur 157, tibia 132, tarsus 118, claw 36, tarsal digitules 54, claw digitules 39; tarsal digitules longer and stouter than those of claw, all distinctly knobbed at apices, tarsal claw with the usual denticle; anal lobes not unusually large nor prominent for the genus, chitinized, with the usual three dorsal spines, two ventral setae, and an apical seta, the latter about 286 μ long; anal ring with the usual single complete row of pores and eight setae, the longest of these about 121 μ ; preapical setae of anal lobes about 96 μ long; body bearing rather numerous large spines over the dorsum as well as at the margin, these, on the abdomen at least, arranged in more or less distinct transverse segmental bands, with spines of smaller size interspersed between the larger, all these spines stout and only slightly constricted at base, tapering almost uniformly to a slender but bluntly rounded tip; those of anal lobes proportionately distinctly more slender than the remainder; longest anal lobe spine about 40 μ in length, largest marginal spine about 54 μ in length, largest dorsal spines about 50 μ in length, smallest dorsal spine about 22 μ in length; large tubular ducts with the tube of average length, the inverted cup wide and fairly deep, these ducts scattered in segmental arrangement over the dorsal surface, and at the margins ventrally; body also

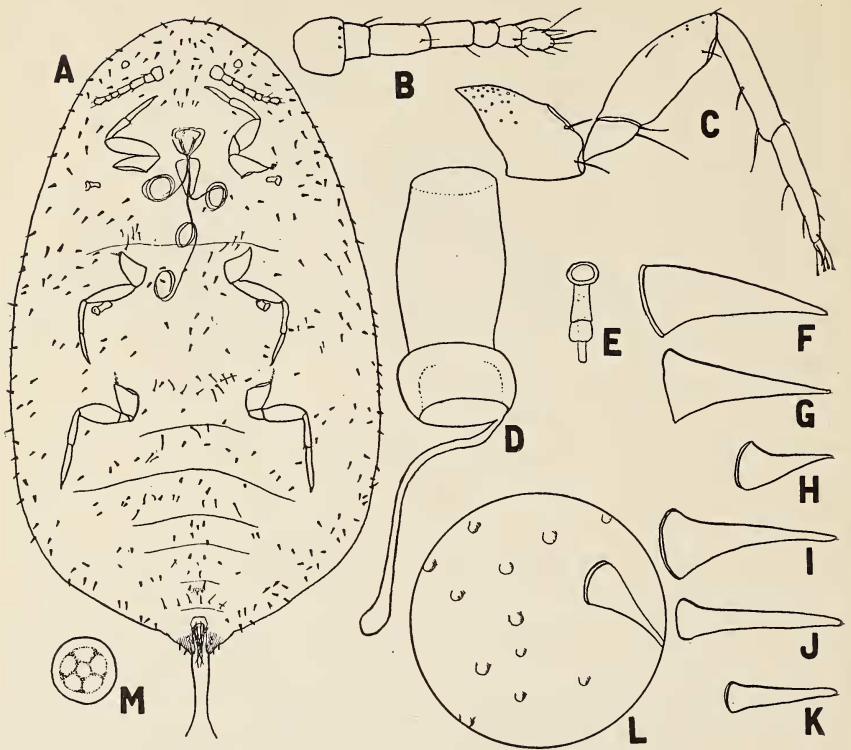


FIG. 34. *ERIOCOCCUS PAPILLOSUS*, sp. nov.

A, outline of body, optical section, showing appendages, spines and larger setae, $\times 40$; B, antenna, $\times 120$; C, posterior leg, $\times 120$; D, large tubular duct, $\times 1500$; E, small tubular duct, $\times 1500$; F, marginal spine, $\times 530$; G, large dorsal spine, $\times 530$; H, small dorsal spine, $\times 530$; I, apical anal lobe spine, $\times 530$; J, outer anal lobe spine, $\times 530$; K, inner anal lobe spine, $\times 530$; L, portion of derm showing papillae, $\times 530$; M, disk pore, $\times 1500$; all adult female.

with minute symmetrical tubular ducts dorsally, but in much fewer numbers than the preceding; ventrally with smaller, quinquilocular disk pores; derm dorsally and at margins bearing numerous, but scattered, tiny papillae or tubercles rather uniformly distributed over the whole area; largest ventral abdominal seta about 50μ .

No other stages available for examination.

This species has been described from two specimens mounted on slides, collected in the Galapagos Islands in company with a large number of specimens of *Orthezia galapagoensis* and having the following data: "From stems of *Heliotropium parviflorum*, Seymour Bay, Indefatigable, April 25." (Invert. no. 2369.)

The types are in the U. S. National Collection of Coccidae.

Of the species of the genus *Eriococcus* with which the writer is familiar,

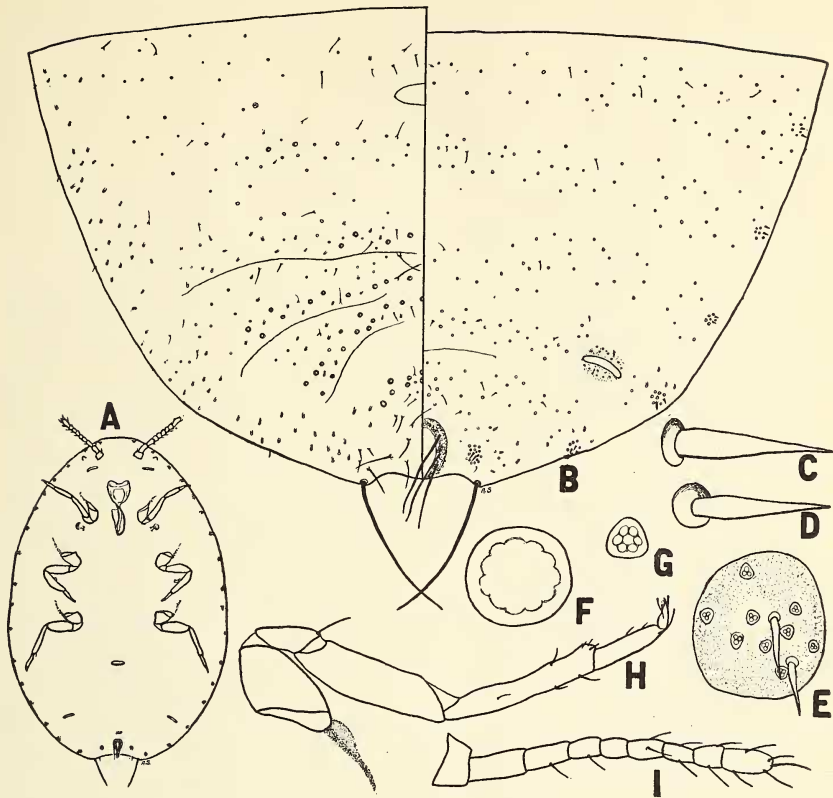


FIG. 35. *PHENACOCCLUS PARVUS*, sp. nov.

A, outline of body, optical section showing position and relation of parts, $\times 21$; B, apex of abdomen, dorsal and ventral, $\times 88$; C, apical cerarian spine, $\times 1500$; D, penultimate cerarian spine, $\times 1500$; E, lateral abdominal cerarius from unexpanded adult, $\times 530$; F, multilocular disk pore, $\times 1500$; G, triangular pore, $\times 1500$; H, middle leg, $\times 120$; I, antenna, $\times 120$; all adult female.

this appears to approach most closely *Eriococcus palmeri* Kkll., described from Lower California, from which species it differs most obviously in the larger size and more elongate and more slender antennae as well as in the possession of the cuticular tubercles, these not being in evidence in *E. palmeri*.

Genus *Phenacoccus* Ckll.

Phenacoccus parvus sp. nov.

Adult Female.—Only alcoholic specimens available for examination,[†] so no description of normal external appearances can be given; length of fully distended specimens as mounted on slide 1.8 to 2 mm.; width 1.2 to 1.3 mm.; normal shape either uniformly oval or very slightly broader behind; derm clearing

completely on treatment with potassium hydroxide in old specimens, but retaining faintly suggested indistinct disks below each cerarius in undistended adult females; of the usual Pseudococcine type, antennae normally 9-segmented, the range of measurements in microns of those available for study as follows: I, about 36; II, 46-61; III, 46-53; IV, 32-39; V, 29-36; VI, 29-36; VII, 29-32; VIII, 32-36; IX, 54-61; (segments 4 and 5 incompletely separated in one antenna); legs not unusual, hind coxae without pores, measurement of a middle leg in microns as follows: coxa 125, trochanter 79, femur 186, tibia 190, tarsus 89, claw 29; claw with a distinctly developed denticle about one-third of length from apex, digitules slender, those of claw knobbed, those of tarsus acute at apices; beak elongate, triangular, more or less distinctly 2-segmented, length about 114 μ ; with the usual anterior and posterior pairs of slit-like dorsal ostioles; with eighteen pairs of cerarii along the body margin, each of these composed of two slender lanceolate spines and a few (3 to 9) triangular pores, and each underlaid, in newly emerged and undistended adult females only, by a fairly distinct, but only slightly chitinized, circular to oval disk; rarely with one or two smaller dorsal spines approximating the cerarian area so closely as to appear to be a part of the cerarius, average length of cerarian spines 11 μ , spines of apical cerarii about 17 μ long, correspondingly larger than the others on the body and accompanied by more triangular pores than any other cerarii; apical setae of anal lobes about 196 μ long; without ventral chitinized thickenings on anal lobes, but with several setae of various sizes ventrally just anterior to the apical setae; anal ring bearing six setae averaging about 107 μ in length and each half composed of an inner scalloped band of irregularly shaped larger pores and an outer band of nearly uniformly rounded, smaller, but less heavily chitinized, pores; dorsally, at least in the abdominal region, with transverse segmental rows of scattered triangular pores and slender lanceolate spines, the former much more abundant than the latter; with tubular ducts of moderate size surrounding the cerarii dorsally and ventrally at the body margin and extending in transverse segmental bands of scattered ducts across the ventral abdominal segments; with five transverse segmental rows of scattered large circular disk pores ventrally in the abdominal region; also ventrally with transverse segmental single rows of setae of different sizes; with a single, transversely oval to quadrate, cicatrix.

No other stages of this species have been available for examination.

This species has been described from four mounted specimens collected "on bush near shore, Tover, Apr. 28" (Invert. no. 2413).

The types are in the U. S. National Collection of Coccidae.

The present state of the classification of *Phenacoccus* and related genera is such that the writer can make no precise suggestions regarding the relationships of the species described above. Its structural characters appear to be quite commonplace, leaving its comparatively small size the most evident feature of the species.

Pseudococcus galapagoensis sp. nov.

Adult Female.—Only alcoholic specimens available for examination, so nothing regarding the external appearance can be given; length 3.5 mm., width 2 mm.; elongate oval, apices tending to be pointed; antennae normally

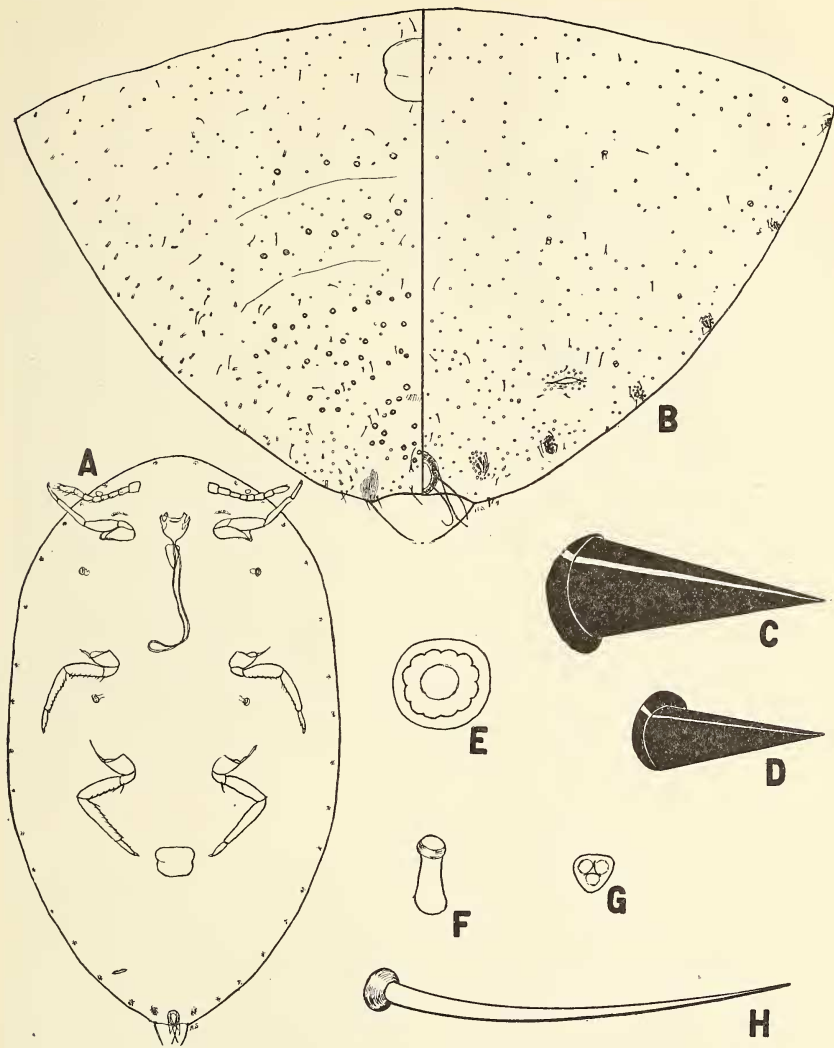


FIG. 36. *PSEUDOCOCCUS GALAPAGOENSIS*, sp. nov.

A, outline of body, optical section, $\times 21$; B, posterior apex of abdomen, dorsal and ventral, $\times 60$; C, apical cerarian spine, $\times 1500$; D, penultimate cerarian spine, $\times 1500$; E, multilocular disk pore, $\times 1500$; F, small tubular duct, $\times 1500$; G, triangular pore, $\times 1500$; H, body seta, $\times 1500$; all adult female.

8-segmented, lengths of segments in microns as follows: I, 64; II, 78; III, 68; IV, 43-46; V, 46-57; VI, 39-43; VII, 39; VIII, 93-96; legs not unusual, lengths of parts of middle leg in microns as follows: coxa 196, trochanter 107, femur 268, tibia 278, tarsus 103, claw 36; claw without denticle, both tarsal and claw

digitules slightly knobbed at apices, those of claw distinctly stouter near base, hind coxa without distinctly developed, enlarged pores, although both coxa and femur with some such enlarged pores or aerolations faintly suggested; beak elongate triangular, distinctly 2-segmented, length 171μ , width at base 114μ ; with the usual two pairs of dorsal ostioles, the anterior pair relatively inconspicuous; with 17 pairs of cerarii, the typical arrangement of each consisting of two spines surrounded by a cluster of pores and, at outer margin of this, 4 setae, this arrangement varying however, as few as three pores and one seta being present; spines of posterior cerarii distinctly larger and stouter than any of the others, the size of these gradually reduced anteriorly; a tabulation of the cerarian spines showing the following count: I (anterior), 3; II, 2; III, 2-3; IV, 1-2; V, 2; VI, 2-3; VII to XVII inclusive, 2 each; pores in the anal lobe cerarii fairly closely crowded, those in the other cerarii more scattered; apical seta of anal lobes about 121μ long, ventral surface of anal lobes with a small, not very distinctly chitinized, thickening; anal ring with the usual inner and outer rows of pores and with six setae, these averaging about 130μ in length; derm dorsally, at least in the abdominal region, with triangular pores and some small setae, and, on some abdominal segments, with an enlarged tubular duct just within each cerarius and another similar duct about half way between the center line and each of the submarginal ducts; ventrally with larger setae and large multilocular disk pores in definite transverse rows in the abdominal region, clusters of small short tubular ducts around and between the cerarii, mostly on the ventral surface, and similar ducts and triangular pores scattered over the mid-ventral area; the single ventral cicatrix quite large and more or less distinctly quadrate with rounded corners.

This species has been described from a single mounted specimen having the following data: "from roots of a yellow-plumed ground plant, Eden Island, N.W. coast of Indefatigable, April 8" (Invert. no. 2204).

The type is in the U. S. National Collection of Coccidae.

Pseudococcus insularis sp. nov.

Adult Female.—Only alcoholic specimens available for examination, so nothing regarding normal external appearances can be given; length as mounted on slide 3.4 mm., width 1.9 mm.; body elongate oval, tapering somewhat posteriorly; antennae of the normal Pseudococcine type, 8-segmented, measurements in microns of the segments available for study as follows: I, 64-68; II, 89; III, 86-89; IV, 57; V, 57-64; VI, 50; VII, 46; VIII, 107; legs of the usual Pseudococcine type, hind coxae without pores, length in microns of a middle leg as follows: coxa about 160, trochanter 125, femur 300, tibia 300, tarsus 107, claw 36; claw without denticle, claw digitules fairly distinctly knobbed at apices, tarsal digitules very slightly knobbed; beak fairly stout-conical, indistinctly 2-segmented; with the usual anterior and posterior pairs of slit-like dorsal ostioles; differing from the normal Pseudococcus type in the possession of only fifteen pairs of cerarii, each of these composed of triangular pores, accessory setae and spines, the latter running as follows in the cerarii examined: I, 3; II, 3; III, 3; IV, 2; V, 2; VI, 2-3; VII-XV, 2 each; number of accessory setae varying from 1 to 4 in the anterior and lateral cerarii, increasing to 5 in the

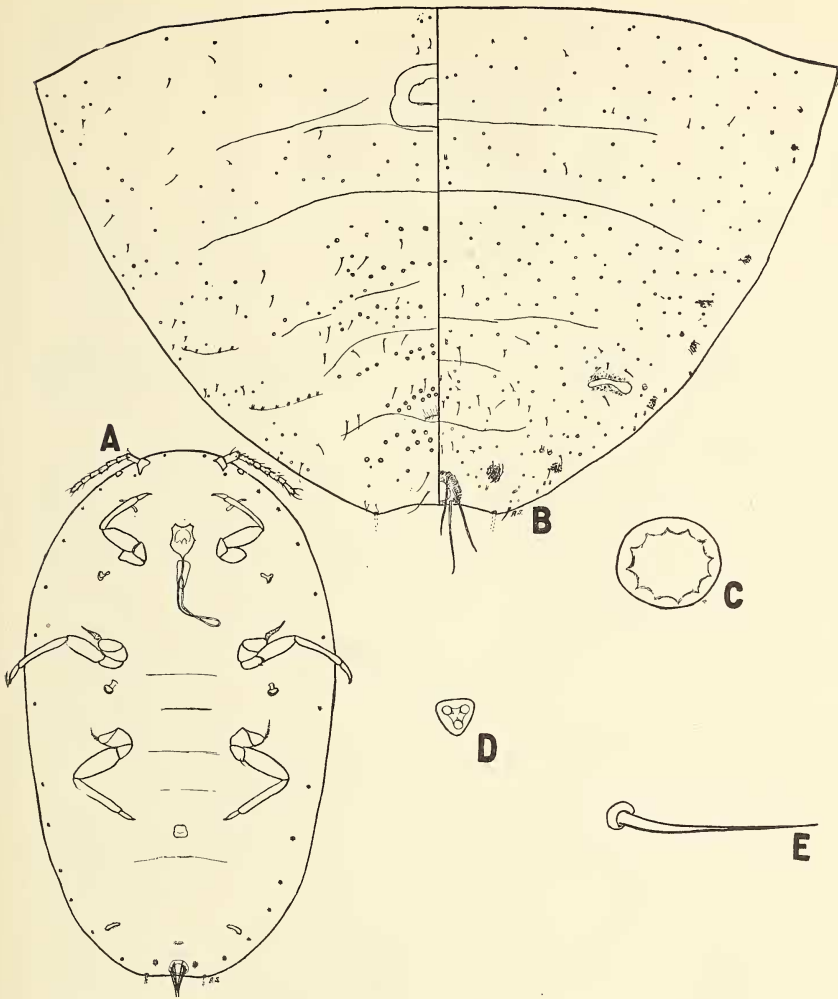


FIG. 37. *PSEUDOCOCCUS INSULARIS*, sp. nov.

A, outline of body, optical section, $\times 21$; B, apex of abdomen, dorsal and ventral, $\times 60$; C, multifolcular disk pore, $\times 1500$; D, triangular pore, $\times 1500$; E, body seta, $\times 1500$; all adult female.

anal lobe cerarii; spines of anal lobe cerarii conspicuously larger than any of the others, those of the preapical cerarii intermediate in size, the remaining cerarian spines much smaller and more slender; triangular pores of apical cerarii closely crowded to form a dense oval cluster surrounding the spines, those of the remaining cerarii distinctly but not widely separated from one another; apical setae of anal lobes broken, but probably, from diameter of socket, longer than

those of anal ring; anal ring setae about $160\ \mu$ long; no ventral chitinous thickenings on the anal lobes; dorsally, at least in the abdominal region, with transverse segmental rows of widely scattered slender setae and much more numerous but scattered segmental bands of triangular pores, also, at least on some segments, with one or two median and one or two submarginal dorsal enlarged tubular ducts; ventrally, at least in the abdominal region, with seven transverse rows or clusters of large circular disk pores, with indistinct clusters of widely separated small tubular ducts beneath each cerarius and with more or less distinctly developed, transverse rows of widely scattered triangular pores, smaller tubular ducts and slender setae; anal ring rather narrow, with six setae and the usual inner and a single outer row of pores; ventral cicatrix large, more or less distinctly quadrate, with rounded corners, somewhat constricted transversely about the middle.

This species has been described from a single mounted specimen collected "under stone near brackish water pool, South Seymour, Apr. 20" (Invert. no. 2272).

The holotype is in the U. S. National Collection of Coccidae.

The insect above described rather closely resembles the preceding species, differing, however, in presumably important characteristics, in that it has only 15 pairs of definitely developed cerarii and has no visible ventral chitinized thickening on the anal lobes. There are also apparent differences in the relative and actual numbers of the various types of pores present but the constancy of such differences has not thus far been established.

Subfamily COCCINAE

Ceroplastes sp.

Two lots of specimens of a species of *Ceroplastes* were included with the material examined. The outer waxy covering of a few of the specimens was in fairly good condition, but only fragmentary portions of the female body could be obtained for study purposes. While the species does not appear to agree with any of the described forms with which the writer is familiar and is quite probably undescribed, the material available does not permit the preparation of an adequate and satisfactory description.

The following data accompanied the two lots of material: "from bag of earth and leaves taken from under *Maytena* bushes on Eden Island, N.W. of Indefatigable, Apr. 8, 1923" (Invert. no. 2183) and "Under lava, Seymour Bay, Indefatigable, April 25" (Invert. no. 2552).

This is one of the series of scientific papers of the Harrison Williams Galapagos Expedition, under the directorship of William Beebe, sent out by the Department of Tropical Research of the New York Zoological Society. The general account and narrative of the expedition, together with the natural history and photographs of the fauna, are embodied in a volume by William Beebe, published by G. P. Putnam's Sons, under the auspices of the Zoological Society. Its title is "Galapagos; World's End."